

As amended, claim 1 recites an additive system for direct addition to poly(vinyl chloride) - containing matrix resins which contains a multistage, polymeric, acrylic-base impact modifier. According to the prior art cited by Applicants, the PVC manufacturing industry has only uses multistage, polymeric, acrylic-base impact modifiers which are in a powder or pellet form. Not until the present application has it been disclosed or suggested to make and use a multistage, polymeric, acrylic-base impact modifier which is in a wetcake, slurry or emulsion form.

While the art cited in the outstanding Action dose disclose polymers in a liquid, it is respectfully submitted that they do **not** disclose an additive system for direct addition to poly(vinyl chloride) - containing matrix resins which consists essentially of:

- a. a liquid component which includes water; and
- b. a solid component which includes a **multi-staged, acrylic-based impact modifier** for a poly(vinyl chloride) - containing matrix resin comprising:
 - i. at least **70 weight percent** of a polymerized core comprising, as polymerized units, a **C₂ to C₁₂ alkyl acrylate**, and
 - ii. at least **1 weight percent** of a polymerized shell comprising, as polymerized units, a **C₁ to C₄ alkyl methacrylate**.

To the contrary, Vaughn discloses a finish/polish for whit leather; Takahashi discloses an agent for overcoating heat-sensitive recording materials; Chen discloses a neutralized latex used in manufacturing water-reducible coatings; Gujarathi discloses a styrene-butadiene rubber (SBR) used in the manufacture of tires; Grim discloses nitril-containing raw rubber crumbs used in the manufacture of rubber products; Lee discloses polybutadiene latexes used in the polymerization of butadiene; Thames discloses latex compositions containing internally plasticizing and crosslinkable long-chain alkenol ester monomers which can be used in coatings, adhesives and inks; Selvarajan discloses a specific water/polymer composition used to clarify red mud-containing liquors generated by a process used to produce alumina bauxite (i.e., the "Bayer Process"); Belik discloses a foamable polyvinyl halogenated resin mass; and Pavlyuchenko discloses a latex containing hollow polymer particles used as opacifying agents.

Applicants submit that none of the cited referenced disclose the additive system **for direct addition to poly(vinyl chloride) - containing matrix resins** recited in claim 1. Accordingly, Applicants respectfully request that the rejections of claim 1 under Section 102(b) and 102(e) be reconsidered and withdrawn. Moreover, since claims 2-4, 6, 19, 20, and 23 are ultimately dependent upon claim 1, it is further respectfully requested that the Section 102(b) and 102(e) rejections of theses claims also be reconsidered and withdrawn.

Claims 1-6 and 18-31 are also rejected under 35 USC 103(a). Applicants respectfully traverse this rejection.

In the first instance, Applicants submit that the references used to formulate this rejection are non-applicable prior art. Specifically, one of ordinary skill in the field of improving the impact modification of PVC-containing resin systems would not look to any of the references set out above as disclosing an additive system for this purpose. Rather, when looking in the art, the skilled artisan would be directed to powder or pellet form impact modifiers. **direct addition to PVC - containing resins.**

Moreover, even if the references were considered, they do not disclose or suggest to that skilled artisan an additive system **for direct addition to poly(vinyl chloride) - containing matrix resins** which consists essentially of:

- a. a liquid component which includes water; and
- b. a solid component which includes a **multi-staged, acrylic-based impact modifier** for a poly(vinyl chloride) - containing matrix resin comprising:
 - i. at least **70 weight percent** of a polymerized core comprising, as polymerized units, a **C₂ to C₁₂ alkyl acrylate**, and
 - ii. at least **1 weight percent** of a polymerized shell comprising, as polymerized units, a **C₁ to C₄ alkyl methacrylate**.

Accordingly, Applicants respectfully request that the rejections of claim 1 under Section 103(a) be reconsidered and withdrawn. Moreover, since claims 2-4, 6, 19, 20, and 23 are ultimately dependent upon claim 1, it is further respectfully requested that the Section 103(s) rejection of theses claims also be reconsidered and withdrawn.

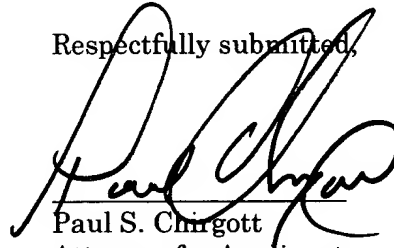
CONCLUSION

In view of the foregoing, Applicants respectfully submit that, in view of the amendments, remarks and arguments set out above, the claims are in condition for allowance. Therefore, reconsideration, withdrawal of rejections, and favorable action thereupon are respectfully requested.

If the Examiner wishes to discuss the application further, Applicants' attorney would welcome either a telephonic or an in-office interview.

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Respectfully submitted,

A handwritten signature in black ink, appearing to read "Paul S. Chirgott", written over a horizontal line.

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims

1. ~~An aqueous~~ additive system for direct addition to ~~polymeric~~ poly(vinyl chloride) - ~~containing matrix resins comprising~~ consisting essentially of:

a. 95 to 30 weight percent of a liquid component, wherein said liquid component comprises water; and

b. 5 to 70 weight percent of a solid component, wherein said solid component comprises an impact modifier for a poly(vinyl chloride) - containing matrix resin, and wherein said impact modifier is a multi-stage copolymer which comprises:

i. at least 70 weight percent of a polymerized core comprising, as polymerized units, a C₂ to C₁₂ alkyl acrylate, and

ii. at least 1 weight percent of a polymerized shell comprising, as polymerized units, a C₁ to C₄ alkyl methacrylate.

at least one polymeric additive selected from

~~i) polymers comprising, as polymerized units, alkyl acrylates;~~

~~ii) polymers comprising, as polymerized units, alkyl (meth)acrylates;~~

~~iii) polymers comprising, as polymerized units, 1,3-dienes;~~

~~iv) polymers comprising, as polymerized units, aromatic vinyl monomers;~~

~~v) polymers comprising, as polymerized units, acrylonitrile;~~

~~wherein the polymeric additive is present in amounts from 5 to 70 percent by weight of the additive system.~~

4. The additive system of claim 1, 2 or 3 wherein the polymeric additive component for a poly(vinyl chloride) - containing matrix resin further comprises a processing aid which aids in the conversion of the matrix resins, under conditions of heat and shear, to a molten plastics. ~~a graft copolymer comprising at least 10 percent by weight of a rubbery core.~~

~~5. The additive system of claim 4 wherein the rubbery core exceeds 70 percent by weight of the graft copolymer.~~

6. The additive system of claim ~~5~~1 wherein the rubbery core is from 90 to 95 percent by weight of the graft copolymer.

~~7. A method of blending additives with polymeric matrix resins comprising~~
~~A) forming an additive matrix mixture by contacting said polymeric~~
~~matrix resins with an aqueous additive system comprising at least one~~
~~polymeric additive selected from~~

~~i) polymers comprising, as polymerized units, alkyl acrylates;~~

~~ii) polymers comprising, as polymerized units, alkyl~~
~~(meth)acrylates;~~

~~iii) polymers comprising, as polymerized units, 1,3-dienes;~~

~~iv) polymers comprising, as polymerized units, aromatic vinyl~~
~~monomers;~~

~~_____ v) polymers comprising, as polymerized units, acrylonitrile;~~

~~wherein the polymeric additive is present in amounts from 5 to 70~~
~~percent by weight of the additive system; and~~

~~B) drying said additive matrix mixture.~~

~~8. The method of claim 7 wherein the polymer matrix is in powder form.~~

~~9. The method of claim 7 wherein the polymer matrix is in the form of wet cake.~~

~~10. The method of claim 7 wherein the polymer matrix is in the form of a melt.~~

~~11. The method of claim 7 wherein the additive system is in the form of an~~
~~emulsion.~~

- ~~12. The method of claim 7 wherein the additive system is in the form of coagulated slurry or wetcake.~~
- ~~13. The method of claim 8, 9, 10, 11, or 12 wherein the polymeric additive is a graft copolymer comprising at least 10 percent by weight of a rubbery core.~~
- ~~14. The method of claim 8, 9, 10, 11, or 12 wherein the rubbery core exceeds 70 percent by weight of the graft copolymer.~~
- ~~15. The method of claim 14 wherein the rubbery core is from 90 to 95 percent by weight of the graft copolymer.~~
- ~~16. The method of claim 7 wherein the dry weight ratio of polymeric additive to matrix polymer is from 0.1:99.9 to 25:75.~~
- ~~17. The method of claim 7 wherein the polymeric matrix resin comprises polymerized units of vinyl chloride.~~
- ~~18. An aqueous additive system for direct addition to polymeric matrix resins comprising at least one polymeric additive selected from~~
- ~~i) polymers comprising, as polymerized units, alkyl acrylates;~~
 - ~~ii) polymers comprising, as polymerized units, alkyl (meth)acrylates;~~
 - ~~iii) polymers comprising, as polymerized units, 1,3-dienes;~~
 - ~~iv) polymers comprising, as polymerized units, aromatic vinyl monomers;~~
 - ~~v) polymers comprising, as polymerized units, acrylonitrile;~~
- ~~wherein the polymeric additive is present in amounts from 5 to 70 percent by weight of the additive system, and~~

~~wherein the at least one polymeric additive is a processing aid which aids in the conversion of the matrix resins, under conditions of heat and shear, to a molten plastic.~~

19. The additive system of claim ~~18~~ 4 wherein the processing aid is a lubricating processing aid.

20. The additive system of claim ~~18~~ 4 wherein the processing aid is a single stage or multi-stage polymer.

~~21. The additive system of claim 18 wherein the processing aid does not contain a hard outer shell.~~

~~22. The additive system of claim 18 further comprising at least one polymerization adjuvant.~~

23. The additive system of claim ~~18~~ 4 further comprising ~~one or more other ingredients commonly used in matrix resin blends~~ at least one compound selected from the group consisting of: a plasticizers, a UV stabilizers, a lubricants, a waxes, a pigments, a toners, a rheology modifiers, a flame retardants, a thermal stabilizers, an antiozoxidants, a fillers, a mold release agents, and a hollow spheres.

~~24. An aqueous additive system for direct addition to polymeric matrix resins comprising at least one polymeric additive selected from~~

~~i) polymers comprising, as polymerized units, alkyl acrylates;~~

~~ii) polymers comprising, as polymerized units, alkyl (meth)acrylates;~~

~~iii) polymers comprising, as polymerized units, 1,3-dienes;~~

~~iv) polymers comprising, as polymerized units, aromatic vinyl monomers;~~

~~v) polymers comprising, as polymerized units, acrylonitrile;~~

~~wherein the polymeric additive is present in amounts from 5 to 70 percent by weight of the additive system;~~

~~wherein the at least one polymeric additive is an impact modifier which improves the impact strength of the polymeric matrix resins; and~~

~~wherein the polymeric matrix resin comprises polymerized units of vinyl chloride.~~

~~25. The additive system of claim 24 wherein the impact modifier is not isolatable as a powder.~~

~~26. The additive system of claim 24 wherein the impact modifier is isolatable as a powder.~~

~~27. The additive system of claim 24 wherein the impact modifier is an AIM or MBS impact modifier.~~

~~28. The additive system of claim 24 wherein the impact modifier is an AIM impact modifier containing from 90 to 100 weight percent of a butyl acrylate core polymer.~~

~~29. The additive system of claim 24 wherein the impact modifier does not contain a hard shell.~~

~~30. The additive system of claim 24 further comprising at least one polymerization adjuvant, wherein the polymerization adjuvant is selected from the group consisting of defoamers, level agents, antioxidants, plasticizers, emulsion stabilizers, protective colloids, biocides, defoamers, and combinations thereof.~~

~~31. The additive system of claim 24, further comprising one or more other ingredients commonly used in matrix resin blends, wherein the one or more other ingredients are selected from the group consisting of plasticizers, a UV stabilizers, lubricants, waxes, pigments, toners, rheology modifiers, flame retardants, thermal stabilizers, antiozodants, fillers, mold release agents, hollow spheres, and combinations thereof.~~